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Coastal measurements of short-lived reactive iodocarbons and bromocarbons at Roscoff, Brittany during the RHaMBLe campaign

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Abstract. Atmospheric concentrations of the volatile reactive iodocarbons C₂H₅I, 1-C₃H₇I, 2-C₃H₇I, CH₂ICl, CH₂I₂, CH₂I₂ and bromocarbons CH₂Br₂ and CHBr₃ were determined by GC/MS analysis of marine boundary layer air at Roscoff, Brittany on the northwest coast of France during September 2006. Comparison with other coastal studies suggests that emissions of these trace gases are strongly influenced by site topography, seaweed populations and distribution, as well as wind speed and direction and tide height. Concentrations of the very short-lived dihalomethanes CH₂I₂ and CH₂I₂ in particular showed evidence of tidal dependence, with higher concentrations observed at low tide during maximum exposure of seaweed beds. We also present a limited number of halocarbon measurements in surface seawater and estimate sea-air fluxes based on these and simultaneous air measurements. CH₂Br₂ and CHBr₃ were strongly correlated both in air and in seawater, with CH₂Br₂/CHBr₃ ratios of 0.19 in air and 0.06 in water. The combined midday I atom flux from the photolabile dihalomethanes CH₂I₂, CH₂I₂ and CH₂ICl of $\sim 5 \times 10^3$ molecules cm⁻³ s⁻¹ is several orders of magnitude lower than the estimated I atom flux from I₂ based on coinciding measurements at the same site, which indicates that at Roscoff the major I atom precursor was I₂ rather than reactive iodocarbons.

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